

Accident Detection & Ambulance Rescue System Using Wireless Technology

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Abstract—In a today's life we see everywhere like newspaper, tv news that the death of peoples due to accident .The rate of death due to road accident is increased tremendously ,especially accident occurred on highways. When accident occurred at the night time and near the highways that accident is unnoticed by the people due to problems due to police case. The cost of human life is more than any other. Due to all this problem we decided to implement a system which automatically detect accident & reduces the delay of treatment on accident victim due to distance. This system is fully automated.

Keywords— Rescue People, GPS, GSM, Sensor System.

1. INTRODUCTION

Nowadays different sensors are available for detecting various condition .Our project is based on sensor .in this project we implemented three different units which communicate among each other .The first unit is vehicle unit, which is used for the detection of accident.The second unit is ambulance unit which is used to check the parameter of the accident victim.In this unit we designed ECG & heartbeat sensor using op amp IC 741.The communication between vehicle & ambulance takes place via GSM module.Third unit is hospital unit .In thie the parameter of accident victim like heartbeat,ECG,bloodpressure & temperature checked by ambulance unit is displayed continously on hyperterminal software used in hospital PC using CC2500 RF module. So the docters can take immediate action,thus the delay of treatment on accident victim due to distance is minimized & the death due to delay in reaching the ambulance to the hospital can be reduced .

2. OBJECTIVE

- To detect Accident.
- To send the message & location of accident to ambulance.
- Checking of patient parameter & sending to the Hospital.

3. PROPOSED PROJECT

This project consists of three different units, which co-ordinate with each other.

1. vehicle unit.
2. ambulance unit.
3. Hospital unit.

The detailed explanation of this unit is given below.

1) Vehicle unit

In vehicle unit we designed vibration sensor using 2 -wire piezoelectric sensor & IC LM358P as shown in below picture

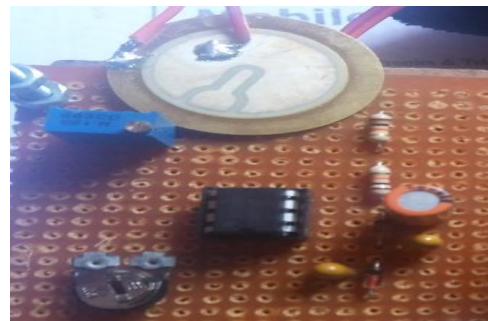


Fig 1: vibration sensor circuit

The vibration sensor is set to particular threshold . If the vibration is above the threshold value then accident alert message is send to ambulance unit,police station & family member of accident victim.In this project we used PIC 18F4550 Microcontroller, which interfaces with GSM and GPS technology. A switch is used to detect minor accident, if the situation is not critical then it terminate the communication between vehicle unit and ambulance unit . The GSM technology is used to send the SMS to ambulance . And also the position of the vehicle can be obtained by the ambulance person using GPS module.

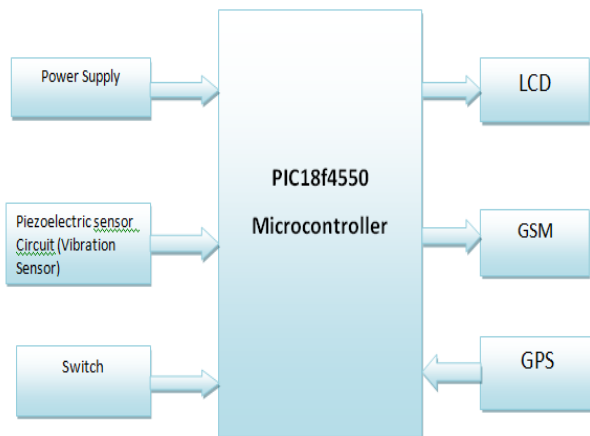


Fig 2 : block diagram of vehicle unit

2) Ambulance unit

To implement this unit, we first designed heartbeat & ECG sensor using op-amp IC OP77AP. The below picture shows design of ECG circuit. ECG circuit is combination of different stages of signal conditioning, first the differential ended signal is converted to single ended, then it passes through low pass filter & high pass filter.



Fig 3: ECG sensor circuit

The design of heart beat sensor is as shown in below picture. This circuit is designed using IC LM324.



Fig 4: heart beat sensor circuit

In this unit PIC 18F4550 microcontroller interfaces with temperature sensor LM35, heart beat sensor, blood pressure sensor and ECG sensor. When patient enters in ambulance then in ambulance blood pressure, heart beat, temperature is checked, and this value is sent to nearest hospital using RF module.

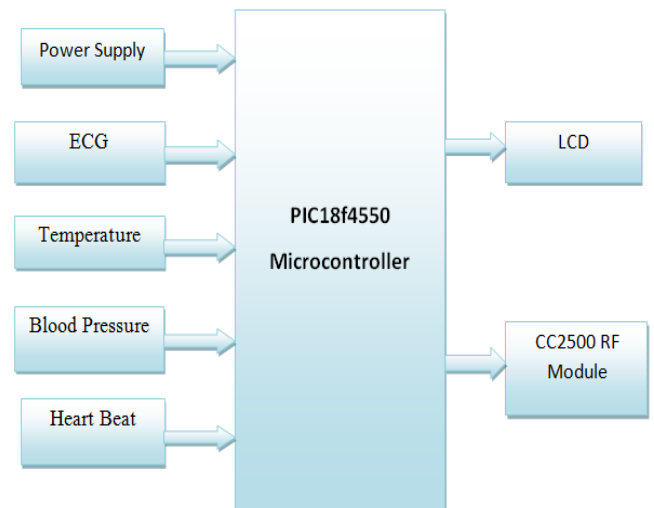


Fig 5: block diagram of ambulance unit

3) The Hospital unit

In this unit, the patients all parameter that we had measured in ambulance are displayed on hyperterminal software in hospital PC. Graphical representation of ECG waveform also displayed on PC. Whereas, CC2500 RF module is interfaces to PC to transmit and received data from other units. CC2500 RF module is used to display value continuously, To take immediate action by doctors.

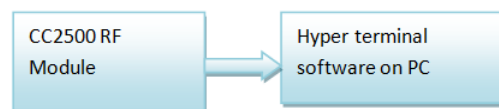


Fig 6: block diagram of Hospital unit

4. RESULTS

Thus we have developed the above mentioned units and successfully co-ordinated the system. For the prototype the communication between the ambulance and hospital unit takes place via RF module of 30m range.

- When accident occurs vehicle send SMS to ambulance. In message link of google map is also send which helps in finding the position of vehicle.

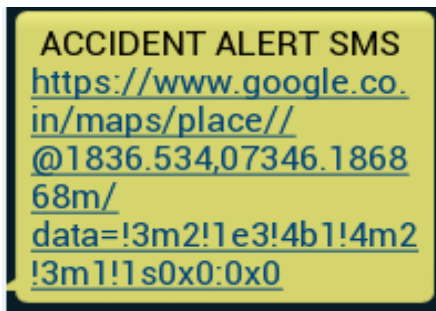


Fig 7: Accident alert message

- Then in ambulance the parameters of the patient is checked this parameter are temperature ,heartbeat, ECG etc.



Fig 8: Patient parameter

- The blood pressure is also checked as shown below.



Fig 9: Blood Pressure reading

- In hospital unit the parameter of patient is displayed on PC using Hyper terminal software

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T:0032 E:0069 H:0232
S:0040
D:0026
T:0032 E:0194 H:0020
S:0040
D:0026
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Fig 9: Hyperterminal Window

5. CONCLUSION

In this paper, we have presented a system to detect accident automatically using vibration sensor, and ambulance unit send the vital parameter of patient to the hospital. This will help to save the life of accident victim.

6. ACKNOWLEDGEMENT

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